

CLAIMS

What is claimed is:

1. A system for power distribution to network devices, the system comprising:  
5 a plurality of network switches each having an internal power supply and a plurality of ports for connecting to the network devices;  
an external power supply having a plurality of output ports for connecting to the network switches,  
wherein the external power supply communicates power available to the  
10 network switches,  
wherein each network switch determines amounts and priority levels of power for the network devices connected thereto, sums together the amounts at each priority level, determines additional amounts and priority levels of power required beyond the internal power  
15 supply capability, and sends a power request to the external power supply, and  
wherein the external power supply allocates power to the network switches depending on the power requests received.
- 20 2. The system of claim 1, wherein cabling connecting the external power supply and the network switches includes a digital communications channel to communicate the power available and the power requests.
3. The system of claim 2, wherein the digital communications channel  
25 comprises a serial communications channel.
4. The system of claim 1, further comprising:  
a programmable current sense and control unit coupled to power output  
for each port of the external power supply.  
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5. The system of claim 4, further comprising:  
a controller in the external power supply configured to determine the allocation of power to the network switches; and

a control bus coupling the controller to each of the programmable current sense and control units in the external power supply.

6. The system of claim 1, further comprising:  
5 a programmable current sense and control unit coupled to power output for each port of each network switch.
7. The system of claim 6, further comprising:  
10 a controller in each network switch configured to determine the allocation of available power to the network devices; and  
a control bus coupling the controller to each of the programmable current sense and control units in the network switch.
8. The system of claim 1, further comprising:  
15 a power multiplexer in each network switch coupled to receive power both from the internal power supply of the network switch and from the external power supply,  
wherein the power multiplexer is controllable to switch available power to the ports of the network switch.
- 20 9. The system of claim 8, wherein the power multiplexer is controllable to switch power from the internal power supply to a first bank of ports, to a second bank of ports, or to both the first and second bank of ports.
- 25 10. The system of claim 9, the power multiplexer is further controllable to switch power from the external power supply to the first bank of ports, to the second bank of ports, or to both the first and second bank of ports.
- 30 11. The system of claim 1, wherein the power requests are determined by arbitration between the network switches.
12. The system of claim 11, wherein the arbitration comprises a master-slave arbitration procedure.

13. The system of claim 11, wherein the arbitration comprises a peer-to-peer arbitration procedure.
- 5 14. A method of power distribution to network devices, the method comprising:  
determining amounts and priority levels of power for the network devices  
connected to each power distributor of a plurality of power  
distributors;  
10 summing together the amounts at each priority level at each power  
distributor; and  
determining additional amounts and priority levels of power required  
beyond an internal power supply capability of each power  
distributor.
- 15 15. The method of claim 14,  
communicating a power request to an external power supply; and  
allocating power by the external power supply to the power distributors  
depending on the communicated power requests.
- 20 16. The method of claim 14, wherein the power distributors comprise network  
switches, and wherein the available power and power requests are  
communicated using a serial data connection between the external power  
supply and each power distributor.
- 25 17. The method of claim 14, further comprising:  
arbitration between the network switches to determine the power  
requests.
- 30 18. The method of claim 17, wherein the arbitration comprises a master-slave  
arbitration procedure.

19. The method of claim 17, wherein the arbitration comprises a peer-to-peer arbitration procedure.
20. A method of distributing power to network devices, the method  
5 comprising:  
associating an amount and priority level of power for each device  
connected to a port of a network switch;  
maintaining in the switch a table of the amount and priority level for each  
switch port; and  
10 using the table to allocate available power to higher priority devices when  
insufficient power is available to fully power all of the connected  
devices.
21. The method of claim 20, wherein the allocation of power is controlled  
15 using current control switches connected to the switch ports.
22. The method of claim 21, wherein the allocation of power is further  
controlled using a power multiplexer circuit which is configured to connect  
to an internal power supply within the switch and to an external power  
20 supply.
23. The method of claim 22, wherein the power multiplexer circuit is  
controllable to switch power from each said power supply to a first bank of  
ports, to a second bank of ports, or to both the first and second bank of  
25 ports.
24. The method of claim 21, further comprising:  
detecting actual power amounts drawn by the network devices using  
current sensors coupled to the switch ports.  
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25. The method of claim 24, wherein if an actual power drawn from a specific  
port exceeds the authorized power to that port, then the current switch  
associated with the port is open to halt the power drawn therefrom.

26. The method of claim 20, wherein the priority level of power for a switch port depends on which type of network device is connected to the port.
- 5 27. The method of claim 26, wherein the higher priority devices include IP-enabled telephone devices.
28. The method of claim 26, wherein the higher priority devices include at least one wireless access point.
- 10 29. The method of claim 20, wherein the priority levels of power for switch ports are manually configurable into the table by a network administrator.
- 15 30. The system of claim 1, wherein the external power supply and the plurality of switches are integrated into a same unit.